AUDIBLE CONFIRMATION USING TEXT TO SPEECH CONVERSION

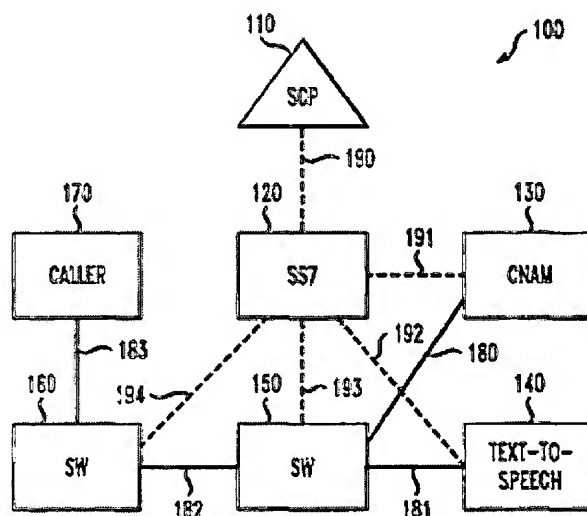|	
Patent number:	EP1157526
Publication date:	2001-11-28
Inventor:	BLACKBURN CONNIE [US]; BRAND JOEL [US]; VARNEY DOUGLAS WILLIAM [US]
Applicant:	LUCENT TECHNOLOGIES INC [US]
Classification:	
- international:	H04M1/56
- european:	H04M1/56
Application number:	EP20000913641 20000225
Priority number(s):	WO2000US05041 20000225; US19990121721P 19990226; US20000513029 20000225

Also published as:

☐ WO0051316 (A1)
☐ CA2364832 (A1)

Abstract not available for EP1157526
Abstract of corresponding document: **WO0051316**

An audible confirmation system automatically and seamlessly outputs an audible name of a call recipient to a calling party. This audible confirmation system is preferably configured to audibly identify the call recipient to the calling party prior to the call recipient and the calling party communicating with each other. The audible confirmation system preferably includes a test to speech converter coupled to an intelligent network architecture having at least one calling name database. The audible confirmation system allows the calling party to audibly identify the call recipient to the calling party without any input from the call recipient and without using any special equipment such as a display screen by the calling party. The audible confirmation system is especially useful when the call recipient does not have voice mail service and is not available to receive a call. For example, by utilizing the audible confirmation system, the calling party is able to confirm the identity of the call recipient prior to leaving a confidential message for the call recipient by utilizing the calling party's voice mail delivery system for automatically delivering the confidential message to the call recipient.

(54) Title: AUDIBLE CONFIRMATION USING TEXT TO SPEECH CONVERSION

(57) Abstract

An audible confirmation system automatically and seamlessly outputs an audible name of a call recipient to a calling party. This audible confirmation system is preferably configured to audibly identify the call recipient to the calling party prior to the call recipient and the calling party communicating with each other. The audible confirmation system preferably includes a test to speech converter coupled to an intelligent network architecture having at least one calling name database. The audible confirmation system allows the calling party to audibly identify the call recipient to the calling party without any input from the call recipient and without using any special equipment such as a display screen by the calling party. The audible confirmation system is especially useful when the call recipient does not have voice mail service and is not available to receive a call. For example, by utilizing the audible confirmation system, the calling party is able to confirm the identity of the call recipient prior to leaving a confidential message for the call recipient by utilizing the calling party's voice mail delivery system for automatically delivering the confidential message to the call recipient.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Faso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

Audible Confirmation Using Text
to Speech Conversion

Related Applications

5   This application claims priority under 35 U.S.C. § 119(e) of the co-pending U.S. provisional application Serial Number 60/121,721 filed on February 26, 1999 and entitled "Audible Confirmation Using Text to Speech Conversion." The provisional application Serial Number 60/121,721 filed on February 26, 1999 and entitled "Audible Confirmation Using Text to Speech Conversion" is also hereby incorporated by reference.

10

Field of the Invention

This invention relates to the field of telecommunications communications systems. More particularly, this invention relates to the field of voice telecommunications systems employing text to speech converters.

15

Background of the Invention

Currently, selected local telephone service providers offer a caller identification service that identifies a telephone number of a calling party to a recipient party of the call. For the recipient party to receive the telephone number of the calling party, the recipient

20   party typically needs to utilize a special display device to visually read the telephone number offered by the caller identification service.

Presently, there are also display telephones that have a screen which displays a telephone number being dialed by the calling party. In theory, the calling party is able to visually confirm the telephone number that was dialed by the calling party and to then

25   match up the displayed telephone number which was dialed by the calling party with the telephone number of the recipient party.

However, looking at a display screen is often inconvenient and sometimes not possible due to screen limitations, lighting environment of the screen, and/or user eyesight limitations which may ultimately render the screen unreadable to the user. Further, merely

30   displaying a telephone number of the call recipient does not often provide enough information. For example, a telephone number by itself does not necessarily reveal the

identity of the called party. Furthermore, the information shown on the display screen is actually stored within a corresponding telephone which may not allow the call recipient to accurately identify the calling party.

What is needed is an audible confirmation system that provides a user with an
5   audible confirmation identifying a call recipient. What is also needed is an audible confirmation system that provides a user with an audible name identifying a call recipient. What is further needed is an audible confirmation system that operates within an existing Intelligent Network architecture and is available to a user utilizing only a conventional telephone.

10

Summary of the Invention

The present invention is an audible confirmation system that automatically and seamlessly outputs an audible name of a call recipient to a calling party. This audible confirmation system is preferably configured to audibly identify the call recipient to the
15   calling party prior to the call recipient and the calling party communicating with each other. The audible confirmation system preferably includes a text to speech converter for interfacing to a calling name database. The calling name database is made to be part of the intelligent network architecture.

In use, the audible confirmation system preferably locates an appropriate portion of
20   the calling name database and retrieves a text name of the call recipient from the calling name database. The location of the appropriate portion of the calling name database is preferably based upon a unique identifier of the call recipient such as a telephone number. Next, the audible confirmation system preferably directs a text to speech converter to transform the text name of the call recipient into a corresponding audible identifier, eg.,
25   their spoken name. After the text to speech converter forms the corresponding audible identifier, the audible identifier is then transmitted to the calling party.

The audible confirmation system allows the calling party to audibly identify the call recipient to the calling party without any input from the call recipient and without using any special equipment such as a display screen by the calling party. The audible
30   confirmation system is especially useful when the call recipient does not have a voice mail service and is not available to receive a call. For example, by utilizing the audible confirmation system, the calling party is able to confirm the identity of the call recipient

prior to leaving a confidential message for the call recipient by utilizing the calling party's voice mail delivery system for automatically delivering the confidential message to the call recipient.

The present invention provides an audible confirmation system and method which operates within an existing Intelligent Network architecture and utilizes existing databases. Additionally, the present invention provides an audible confirmation system and method which automatically and seamlessly provides a calling party with an audible identification of a call recipient prior to communication between the calling party and the call recipient. Finally, the present invention provides an audible confirmation system and method that does not require the calling party to have special equipment.

Brief Description of the Drawings

Figure 1 illustrates a block diagram showing an audible confirmation system configured for implementing a preferred embodiment of the present invention.

Figure 2 illustrates a state diagram showing a sample operation of the present invention.

Figure 3 shows a block diagram of a system for implementing the present invention.

Detailed Description of the Preferred Embodiment of the Present Invention

The present invention is a text to speech conversion system and method which allows a calling party to hear an audible name of a call recipient prior to connecting the calling party to the recipient. This way, the calling party is able to audible identify the call recipient prior to speaking to the call recipient or leaving a voice mail message for the call recipient. Figure 1 illustrates a block diagram showing an Intelligent Network architecture 100 configured for implementing a preferred embodiment of the present invention. The Intelligent Network architecture 100 is shown for exemplary purposes only. It will be apparent to those skilled in the art to modify, substitute, add or delete elements to the Intelligent Network architecture 100 without departing from the scope of the present invention.

The Intelligent Network architecture 100 of Figure 1 includes a signal control point (SCP) 110, a signalling system No. 7 (SS7) network 120, a calling name database (CNAM) 130, a text to speech converter 140, switches 150 and 160, and a caller 170.

Further, the architecture 100 also includes data links 180, 181, 182, and 183, and control links 190, 191, 192, 193, and 194.

The SCP 140 preferably provides control signals to and from the CNAM 130, the switches 150 and 160, and the text to speech converter 140, via the SS7 network 120. The SCP 110 is coupled to the SS7 network 120 via the control link 190. The CNAM 130 is coupled to the SS7 network 120 and the switch 150 via the control link 191 and the data link 180, respectively. The text to speech converter 140 is coupled to the SS7 network 120 and the switch 150 via the control link 192 and the data link 181, respectively. The switch 160 is coupled to the SS7 network 120 and the switch 150 via the control link 194 and the data link 182, respectively. The switch 150 is coupled to the SS7 network 120 via the control link 193. The caller 170 is coupled to the switch 160 via the data link 183. It would be apparent to those skilled in the art to utilize additional or fewer control links.

The CNAM 130 preferably stores a database of written telephone numbers and text names corresponding with each of the written telephone numbers. The text to speech converter 140 is configured to translate text messages into corresponding audible messages. In the present invention, the text to speech converter 140 is preferably configured to translate a text name within the CNAM 130 into a corresponding audible name.

The Intelligent Network 100 is shown for exemplary purposes only. It will be apparent to those skilled in the art to add or delete CNAMs, text to speech converters, switches, and signal control points.

Figure 2 illustrates a timing diagram for describing the operation of the preferred embodiment of the present invention. For the sake of simplicity and clarity, common elements shown in both Figures 1 and 2 also share common reference numerals. For example, the SCP 110, the CNAM 130, the text to speech converter 140, and the switch 160 are common in both Figures 1 and 2. To prevent obscuring the preferred embodiment of the present invention, selected details are omitted in Figure 2 such as control links and data links between the SCP 110, the CNAM 130, the text to speech converter 140, and the switch 160 which are specifically shown in Figure 1 and described above.

In this timing diagram, the CNAM 130 and the text to speech converter 140 in conjunction with the SCP 110 and the switch 160 are described in context with the overall functionality of the Intelligent Network 100. As shown in Figure 2, this timing diagram illustrates interaction between the SCP 110, the CNAM 130, the text to speech converter

140, and the switch 160. According to the preferred embodiment the switch 160 supplies a data link to the calling party 170 (Figure 1) for voice transmission, and the switch 150 (Figure 1) provides data links between the CNAM 130, the switch 160, and the text to speech converter 140. However, it will be apparent to those skilled in the art that a variety

5   of switches may be utilized to provide data links between the calling party 170 (Figure 1), the CNAM 130, and the text to speech converter 140.

First, this timing diagram begins with an initiation sequence at step 200 wherein the SCP 110 preferably queries the switch 160 for commands which indicate that the calling party 170 (Figure 1) is attempting an outgoing call. At step 205, the switch 160 preferably

10 monitors the calling party 170 (Figure 1) for attempts to initiate an outgoing call. Upon the calling party 170 (Figure 1) initiating an outgoing call, the switch 160 preferably notifies the SCP 110 and transmits to the SCP 110 a unique identifier corresponding to the destination of the outgoing call. This unique identifier is preferably a telephone number.

Next, the SCP 110 preferably locates an appropriate CNAM which stores this

15 particular unique identifier via the SS7 network 120 (Figure 1). In this particular example, the CNAM 130 is the appropriate CNAM. As shown in the step 210, the SCP 110 queries the CNAM 130 for a text name associated with the particular unique identifier. In response to finding this text name, the CNAM 130 notifies the SCP 110 in the step 220.

Once the SCP 110 receives notification from the CNAM 130 that the corresponding

20 text name is found, in the step 230, the SCP 110 preferably instructs the text to speech converter 140 to notify the SCP 110 when the corresponding text name is complete. Next, the CNAM 140 sends this corresponding text name to the text to speech converter 140 in the step 235. Preferably, the text to speech converter 140 transforms the text name into a corresponding audible name. After the corresponding audible name is formed, the text to

25 speech converter 140 preferably informs the SCP 110 in the step 240. Next in the step 250, the SCP 110 preferably instructs the switch 160 to deliver the corresponding audible name to the calling party 170 (Figure 1). Finally, the text to speech converter 140 transmits the corresponding audible name to the switch 160 in the step 255.

In use, the preferred embodiment of the present invention as described above and

30 illustrated in Figures 1 and 2 has many practical applications. One such application is to ensure that a calling party correctly delivers a voice message to an intended call recipient when the call recipient does not have a voice mail service, and a voice mail delivery

system is provided by a calling party. This application is described below for exemplary purposes only and is not intended to limit the scope of the preferred embodiment.

For example, suppose a calling party initiates a call to a call recipient. However, the call recipient is not available to answer this call. Assume that the call recipient does not have a voice mail service. Instead of continuing to call back until the recipient's telephone is answered, the calling party is able to leave the recipient a message by utilizing a remote message delivery service associated with either the caller or the recipient. This message delivery service records the calling party's message and automatically re-dials the call recipient until the call recipient's telephone is answered. By utilizing the preferred embodiment of the present invention, the calling party receives audible confirmation of the call recipient's name prior to leaving a message on the message delivery service. In this way, the caller can avoid leaving a message for a person at a wrong number. Preferably the present invention does not require input from the calling party. In use, the calling party simply places a call to the call recipient, and the present invention provides audible confirmation of the call recipient's identity by providing the calling party with the call recipient's audible name. By utilizing the present invention, the calling party is able to positively identify the call recipient such that the call recipient is correct prior to leaving a message to the call recipient.

Figure 3 shows a block diagram of a system for implementing the present invention. The caller 370 dials a telephone number using the speech path 383. The switch 360 notifies the SCP 310 that the caller 370 is attempting to place a call. The notification is made through the control line 394 and 390. The SCP 310 instructs the switch to connect the call temporarily to a Text-To-Speech converter 340. The switch connects the caller to the Text-To-Speech converter 340 through the speech path 381 which in turn is coupled to the switch 360. Concurrently, the dialed number is provided to the Text-To-Speech converter 340 through the control path 394 and 392. The Text-To-Speech converter 340 queries the CNAM database 330 through the control link 392 and 391 to receive the text name associated with the dialed number. Upon receiving the text name, the Text-To-Speech converter 340 converts the text name to an analog signal. The Text-To-Speech converter 340 then plays the analog signal to the caller through the speech path 381 and 383; i.e., it says the name to the caller. After it says the name, the Text-To-Speech converter 340 signals to the SCP 310 that it has completed its task via the control links 392

and 390. The SCP 310 then instructs the switch 360 to continue processing the call and to forward it to its final destination, i.e., the called party connected to the switch 350.

The present invention has been described in terms of specific embodiments incorporating details to facilitate the understanding of the principles of construction and operation of the invention. Such reference herein to specific embodiments and details thereof is not intended to limit the scope of the claims appended hereto. It will be apparent to those skilled in the art that modifications may be made in the embodiments chosen for illustration without departing from the spirit and scope of the invention.

Specifically, it will be apparent to one of ordinary skill in the art that the device of the present invention could be implemented in several different ways and is only illustrative of the preferred embodiment of the invention and is in no way a limitation.
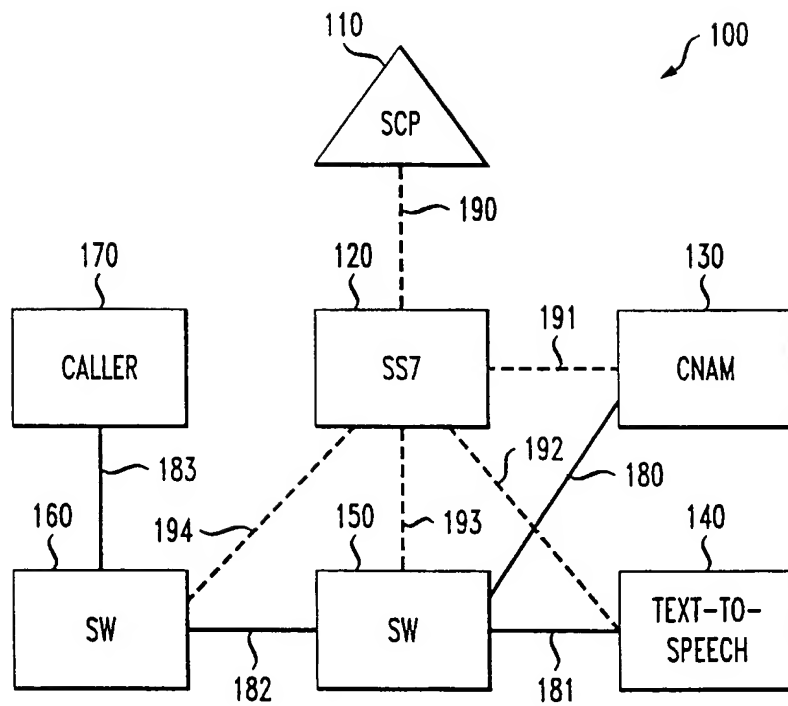
CLAIMS

1   1.   An audible confirmation system in an Intelligent Network for allowing a calling
2   party to audibly hear an audible name of a call recipient, the audible confirmation system
3   comprising:
4   a.   a database configured for storing a plurality of text names wherein each of
5   the plurality of text names is associated with a unique identifier;
6   b.   a control point coupled to the database and configured to retrieve one of the
7   plurality of text names in response to a call recipient selected by the calling
8   party; and
9   c.   a text to speech converter coupled to the control point and configured to
10   convert the selected one of the plurality of text names into the audible name.

1   2.   The audible confirmation system according to claim 1 wherein the unique identifier
2   is a telephone number.

1   3.   The audible confirmation system according to claim 1 wherein the database is a
2   calling name database.

1   4.   A method of allowing a calling party to audibly identify a call recipient, the method
2   comprising the following steps:
3   a.   initiating a call from the calling party directed to an identifier belonging to
4   the call recipient;
5   b.   matching the identifier to a text name corresponding to the recipient within a
6   database;
7   c.   retrieving the text name of the recipient from the database;
8   d.   converting the text name of the call recipient to an audible name; and
9   e.   audibly playing the audible name of the call recipient to the calling party
10   prior to connecting the call.

1   5.   The method according to claim 4 wherein the identifier is a telephone number
2   belonging to the call recipient.

1   6.   The method according to claim 4 wherein the database is a name calling database.

1   7.   The method according to claim 4 further comprising automatically re-dialing the

2   call recipient if the call cannot be connected.

1   8.   The method according to claim 7 further comprising leaving the call recipient a pre-

2   recorded message from the calling party.

1   9.   A method of allowing a calling party to audibly identify a call recipient, wherein

2   the method comprising the following steps:

3   a.   pre-recording a voice message by the calling party directed toward an

4   identifier belonging to the call recipient;

5   b.   matching the identifier to a text name corresponding to the call recipient

6   wherein the identifier and the text name are stored within a database;

7   c.   converting the text name of the call recipient to an audible name; and

8   d.   audibly playing the audible name of the recipient to the calling party.

1   10.   The method according to claim 9 further comprising audibly delivering the voice

2   message to the call recipient subsequent to audibly playing the audible name to the calling

3   party.

1   11.   The method according to claim 9 wherein the database is a name calling database.

1   12.   The method according to claim 9 wherein the database contains a plurality of

2   identifiers and a corresponding plurality of text names.

1   13.   The method according to claim 9 wherein the identifier is a telephone number

2   belonging to the call recipient.

1   14.   The method according to claim 9 further comprising locating the database which

2   contains the identifier and the text name belonging to the recipient among a plurality of
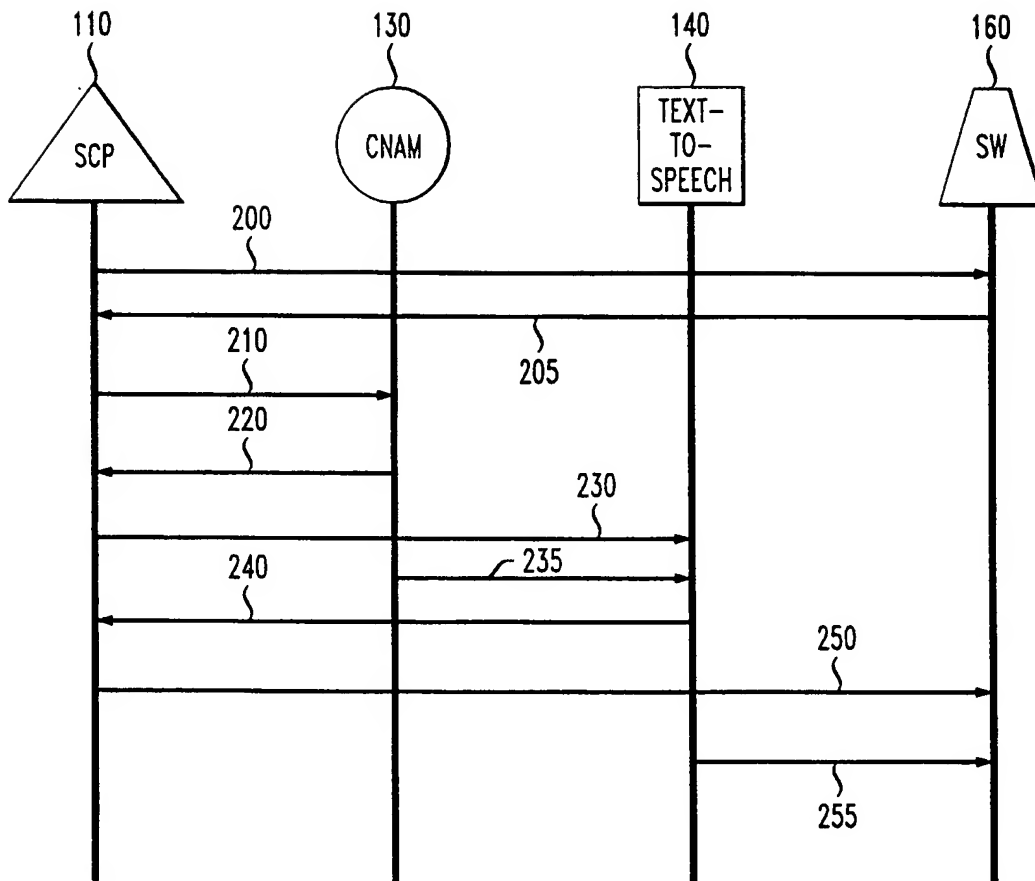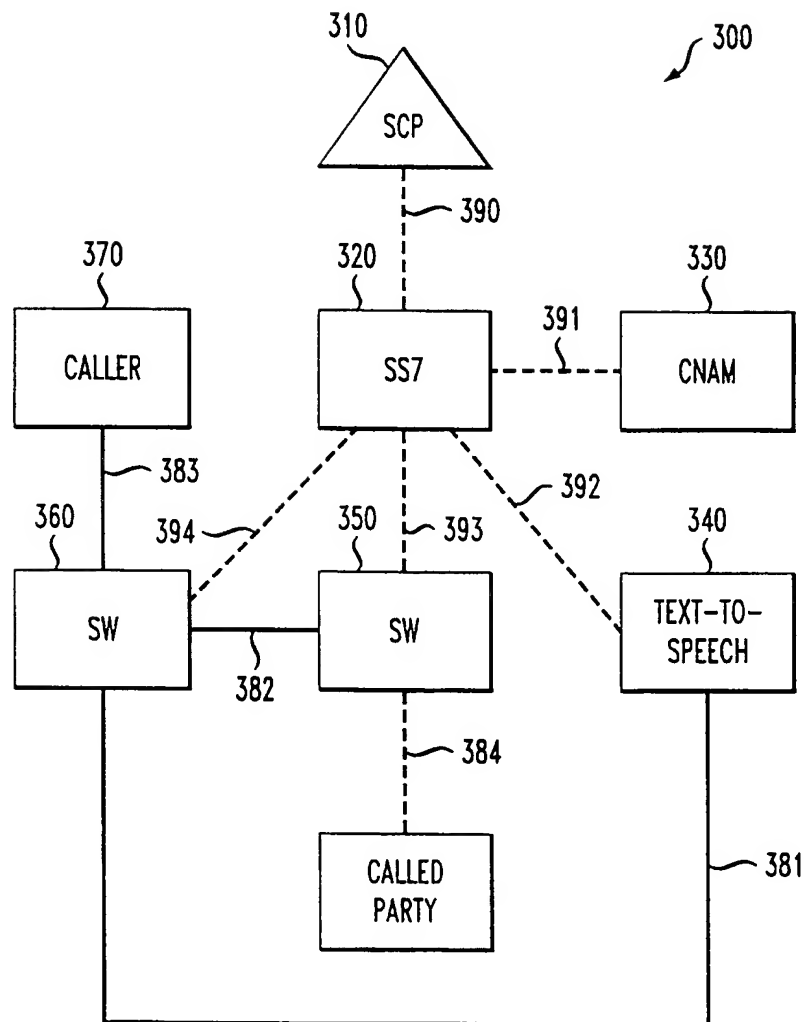
3   databases.

FIG. 1

FIG. 2

FIG. 3

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04M1/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   H04M G10L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2 252 014 A (SAMSUNG ELECTRONICS CO LTD) 22 July 1992 (1992-07-22) abstract; figure 2	1-14
Y	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 08, 30 June 1998 (1998-06-30) & JP 10 079785 A (TOYO COMMUN EQUIP CO LTD), 24 March 1998 (1998-03-24) abstract	1-14

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 May 2000	31/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Wanzeele, R

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 2252014	A	22-07-1992	CN	1063591 A	12-08-1992
			DE	4124104 A	23-07-1992
			FR	2671924 A	24-07-1992
JP 10079785	A	24-03-1998	NONE		